

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A metal stamping system comprising:
 - a press including a ram having a bulbous protrusion projecting outwardly from an end;
 - an upper die shoe including (i) a recess formed in a top surface, said recess being complementary to said bulbous protrusion, and (ii) a plurality of guide posts arranged in a pattern and projecting outwardly from a bottom surface, wherein said bulbous protrusion is received within said complementary recess;
 - a lower die shoe positioned in confronting relation to said surface and including a first plurality of open ended tubular guide bushings each having a first anti-friction bearing assembly positioned within a central passageway, and each located so as to receive a corresponding one of said guide posts; and
 - a stripper-plate positioned between said upper die shoe and said lower die shoe, including a second plurality of open-ended tubular guide bushings each having an outer surface and an inner surface and each projecting outwardly toward said lower die shoe in a pattern corresponding to said pattern of guide posts such that each of said first anti-friction bearing assemblies slidably engages an outer surface of a corresponding one of said second open ended guide bushing, wherein each of said second plurality of open-ended guide

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

bushings includes a second anti-friction bearing assembly positioned on said inner surface so as to engage a corresponding one of said guide posts; and
spring means for separating said upper shoe from said lower shoe after each downward stroke of said ram.

2. (Original) A metal stamping system according to claim 1 wherein each of said open-ended tubular guide bushings includes an annular shoulder that projects radially outwardly from a top end.

3. (Original) A metal stamping system according to claim 1 wherein each of said open-ended tubular guide bushings comprises an internal passageway defined by a hardened surface and sized to slidably accept one of said first anti-friction bearing assemblies.

4. (Original) A metal stamping system according to claim 3 wherein each of said first anti-friction bearing assemblies includes a plurality of circularly and longitudinally spaced ball bearings that are each confined in a bearing cage, wherein said ball bearings are preloaded against said hardened surface.

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

5. (Original) A metal stamping system according to claim 3 wherein each of said first anti-friction bearing assemblies comprises an open ended tubular cylinder.

6. (Original) A metal stamping system according to claim 1 wherein each of said second anti-friction bearing assemblies includes a plurality of circularly and longitudinally spaced ball bearings that are each confined in a bearing cage, wherein said ball bearings are preloaded against a surface of one of said open-ended tubular guide bushings.

7. (Original) A metal stamping system according to claim 6 wherein each of said second anti-friction bearing assemblies include a bearing cage that is cylindrical.

8. (Original) A metal stamping system according to claim 1 wherein said bulbous protrusion projects outwardly from an intermediate plate positioned on an end of said ram.

9. (Original) A metal stamping system according to claim 1 comprising a pair of upper die shoes, a pair of lower die shoes, and a pair of stripper-plates positioned between said upper die shoes and said lower die

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

shoes, wherein said pair of lower die shoes is mounted upon an intermediate plate positioned upon a bolster.

10. (Original) A die set to be reciprocatingly driven in a stamping press comprising:

an upper die shoe including (i) a recess formed in a top surface, said recess being complementary to a bulbous protrusion located on a ram portion of said press, and (ii) a plurality of guide posts arranged in a pattern and projecting outwardly from a bottom surface, wherein said bulbous protrusion is received within said complementary recess;

a lower die shoe positioned in confronting relation to said surface and including a first plurality of open ended tubular guide bushings each having a first anti-friction bearing assembly positioned within a central passageway, and each located so as to receive a corresponding one of said guide posts; and

a stripper-plate positioned between said upper die shoe and said lower die shoe, including a second plurality of open-ended tubular guide bushings each having an outer surface and an inner surface and each projecting outwardly toward said lower die shoe in a pattern corresponding to said pattern of guide posts such that each of said first anti-friction bearing assemblies slidably engages an outer surface of a corresponding one of said second open ended guide bushing, wherein each of said second plurality of open-ended guide

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

bushings includes a second anti-friction bearing assembly positioned on said inner surface so as to engage a corresponding one of said guide posts.

11. (Original) A die set according to claim 10 wherein said upper die shoe includes at least two of said guide posts that are each received within one of said first open ended tubular guide bushings.

12. (Original) A die set according to claim 10 wherein said upper die shoe includes six guide posts wherein each are received within one of said first open ended tubular guide bushings.

13. (Original) A die set according to claim 10 wherein each guide post includes a recess defined at a free end, having a spring mounted therein for separating said upper shoe from said lower shoe after each downward stroke of said ram.

14. (Original) A die set according to claim 10 wherein said stripper-plate includes a pattern of peripheral through-bores arranged in corresponding relation to the positions of said guide posts and said first plurality of open ended tubular guide bushings.

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

15. (Original) A die set according to claim 10 wherein each of said second plurality of open-ended tubular guide bushings includes an internal passageway and an annular shoulder that projects radially outwardly from a top end.

16. (Original) A die set according to claim 15 wherein each of said internal passageways is defined by a hardened surface, and is sized to slidably receive a first anti-friction bearing assembly and one of said guide posts.

17. (Original) A die set according to claim 16 wherein each of said first anti-friction bearing assemblies includes a plurality of circularly and longitudinally spaced ball bearings that are each confined in a bearing cage, wherein said ball bearings are preloaded against a said hardened surface.

18. (Original) A die set according to claim 17 wherein said bearing cage is cylindrical, and sized so as to longitudinally enclose and encircle one of said guide posts.

19. (Original) A die set according to claim 17 wherein each of said first anti-friction bearing assemblies is located between said guide post and bearing cage so as to allow for a prestressed loading of said ball bearings against an outer surface of said guide post.

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

20. (Original) A die set according to claim 10 wherein each of said second anti-friction bearing assemblies includes a plurality of circularly and longitudinally spaced ball bearings that are each confined in a bearing cage.

21. (Original) A die set according to claim 20 wherein each of said bearing cages is cylindrical, and each is sized so as to (i) longitudinally enclose and encircle one of said second plurality of open-ended tubular guide bushings, and (ii) be received within one of said first plurality of open ended tubular guide bushings.

22. (Original) A die set comprising:
two upper die shoes positioned adjacent to one another, and each including a plurality of guide posts arranged in a pattern and projecting outwardly from a surface;

two lower die shoes positioned adjacent to one another, and each positioned in confronting relation to a respective one of said surfaces, and each including a first plurality of open ended tubular guide bushings each having a first anti-friction bearing assembly positioned within a central passageway, and each located so as to receive a corresponding one of said guide posts; and

two stripper-plates, one positioned between each pair of said upper die shoes and said lower die shoes, and each including a second plurality of

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

open-ended tubular guide bushings each having an outer surface and an inner surface and each projecting outwardly toward said lower die shoe in a pattern corresponding to said pattern of guide posts such that each of said first anti-friction bearing assemblies slidably engages an outer surface of a corresponding one of said second open ended guide bushing, wherein each of said second plurality of open-ended guide bushings includes a second anti-friction bearing assembly positioned on said inner surface so as to engage a corresponding one of said guide posts.

23. (New) A metal stamping system comprising:

a press including a ram having a bulbous protrusion projecting outwardly from an end;

an upper die shoe including (i) a recess formed in a top surface, said recess being complementary to and receiving said bulbous protrusion, and (ii) a plurality of guide posts arranged in a pattern and projecting outwardly from a bottom surface, wherein said bulbous protrusion is received within said complementary recess;

a lower die shoe positioned in confronting relation to said surface and including a first plurality of open ended tubular guide bushings each having a first anti-friction bearing assembly positioned within a central passageway, and each located so as to receive a corresponding one of said guide posts; and

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

a stripper-plate positioned between said upper die shoe and said lower die shoe, including a second plurality of open-ended tubular guide bushings each having an outer surface and an inner surface and each projecting outwardly toward said lower die shoe in a pattern corresponding to said pattern of guide posts such that each of said first anti-friction bearing assemblies slidably engages an outer surface of a corresponding one of said second open ended guide bushing, wherein each of said second plurality of open-ended guide bushings includes a second anti-friction bearing assembly positioned on said inner surface so as to engage a corresponding one of said guide posts; and
spring means for separating said upper shoe from said lower shoe after each downward stroke of said ram.

24. (New) A die set to be reciprocatingly driven in a stamping press comprising:

an upper die shoe including (i) a recess formed in a top surface, said recess being complementary to and receiving a bulbous protrusion located on a ram portion of said press, and (ii) a plurality of guide posts arranged in a pattern and projecting outwardly from a bottom surface, wherein said bulbous protrusion is received within said complementary recess;

a lower die shoe positioned in confronting relation to said surface and including a first plurality of open ended tubular guide bushings each having a

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

first anti-friction bearing assembly positioned within a central passageway, and each located so as to receive a corresponding one of said guide posts; and a stripper-plate positioned between said upper die shoe and said lower die shoe, including a second plurality of open-ended tubular guide bushings each having an outer surface and an inner surface and each projecting outwardly toward said lower die shoe in a pattern corresponding to said pattern of guide posts such that each of said first anti-friction bearing assemblies slidably engages an outer surface of a corresponding one of said second open ended guide bushing, wherein each of said second plurality of open-ended guide bushings includes a second anti-friction bearing assembly positioned on said inner surface so as to engage a corresponding one of said guide posts.

25. (New) A die set comprising:

two upper die shoes positioned adjacent to one another, each including a recess formed in a top surface, said recess being complementary to and receiving a bulbous protrusion located on an intermediary plate attached to a ram portion of a press, and each including a plurality of guide posts arranged in a pattern and projecting outwardly from a surface;

two lower die shoes positioned adjacent to one another, and each positioned in confronting relation to a respective one of said surfaces, and each including a first plurality of open ended tubular guide bushings each having a first

Appl. No. 10/624,236
Docket No.: H1535-00019
Preliminary Amendment

anti-friction bearing assembly positioned within a central passageway, and each located so as to receive a corresponding one of said guide posts; and

two stripper-plates, one positioned between each pair of said upper die shoes and said lower die shoes, and each including a second plurality of open-ended tubular guide bushings each having an outer surface and an inner surface and each projecting outwardly toward said lower die shoe in a pattern corresponding to said pattern of guide posts such that each of said first anti-friction bearing assemblies slidably engages an outer surface of a corresponding one of said second open ended guide bushing, wherein each of said second plurality of open-ended guide bushings includes a second anti-friction bearing assembly positioned on said inner surface so as to engage a corresponding one of said guide posts.